

Claims

I claim:

1 514|25 1. A composition comprising a modified glycoside having the formula:

2 (Y)_n-X

4 *TWO components* wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

5 wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the 6 polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one 7 of the saccharide subunits; and

8 wherein the glycoside has at least one hydroxy group derivatized in the form of an 9 ester, mixed ester, ether or mixed ether; and

10 wherein the modified glycoside is in the form of a vitreous glass matrix and has a 11 bioactive substance incorporated therein.

1 2. The composition of claim 1 wherein the saccharide subunits, Y, are the same or 2 different and are selected from the group consisting of glucose, galactose, fructose, ribulose, 3 mannose, ribose, arabinose, xylose, lyxose, allose, altrose, and gulose.

1 3. The composition of claim 1 wherein the polyalcohol is selected from the group 2 consisting of erythritol, ribitol, xylitol, galactitol, glucitol and mannitol.

1 4. The composition of claim 1 wherein the modified glycoside is a hydrogenated 2 maltooligosaccharide or isomaltooligosaccharide.

1 5. The composition of claim 4, wherein the hydrogenated maltooligosaccharide is 2 selected from the group consisting of maltotritol, maltotetraitol, maltopentaitol, 3 maltohexaitol, maltooctaitol, maltononaitol and maltodecaitol.

1 6. The composition of claim 1 wherein the modified glycoside is selected from the
2 group consisting of hydrophobic esters, mixed esters, ethers or mixed ethers of a glycoside
3 of a sugar alcohol.

1 7. The composition of claim 1 wherein said modified glycoside is selected from the
2 group consisting of lactitol nonaacetate, palatinit nonaacetate, glycopyranosyl sorbitol
3 nonaacetate, glucopyranosyl mannitol nonaacetate, maltitol nonaacetate and mixtures thereof.

1 8. The composition according to claim 1, further comprising at least one
2 physiologically acceptable glass selected from the group consisting of carboxylate, nitrate,
3 sulfate, bisulfate, a hydrophobic carbohydrate derivative, and combinations thereof.

1 9. The composition according to claim 1, wherein the composition is in the form of
2 a solid delivery system selected from the group consisting of lozenge, tablet, disc, film
3 suppository, needle, microneedle, microfiber, particle, microparticle, sphere, microsphere,
4 powder, and an implantable device.

1 10. The composition according to claim 1, wherein the substance is a
2 pharmaceutically active chemical.

1 11. The composition according to claim 1, wherein the substance is selected from
2 the group consisting of lipids, proteins, peptides, peptide mimetics, hormones, saccharides,
3 nucleic acids, and protein nucleic acid hybrids.

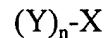
Spec 2

*Lipids -
Nucleic acids Peptides / Proteins, Peptide Mimetics
Protein / NA hybrid Hormones
Saccharides*

1 12. The composition according to claim 11, wherein the proteins are selected from
2 the group consisting of enzymes, growth hormones, growth factors, insulin, monoclonal
3 antibodies, and cytokines.

1 13. The composition according to claim 1, wherein the substance is immunogenic
2 and is selected from the group consisting of live viruses, nucleotide vectors encoding
3 antigens, bacteria, antigens, antigens plus adjuvants and haptens coupled to carriers.

1 14. An optically clear device comprising a modified glycoside having the formula:



3 wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the
4 subunits are linked in a linear or branch chain by glycosidic linkages; and

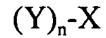
5 wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the
6 polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one
7 of the saccharide subunits; and

8 wherein the glycoside has at least one hydroxy group derivatized in the form of an
9 ester, mixed ester, ether or mixed ether; and

10 wherein the modified glycoside is in the form of a vitreous glass matrix and has a
11 bioactive substance incorporated therein.

1 15. The optically clear device of claim 14 further comprising an optically active dye.

1 16. An optically clear coating on a surface comprising plastic or metal, wherein the
2 coating comprises a modified glycoside having the formula:



4 wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the
5 subunits are linked in a linear or branch chain by glycosidic linkages; and

6 wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the
7 polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one
8 of the saccharide subunits; and

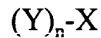
9 wherein the glycoside has at least one hydroxy group derivatized in the form of an
10 ester, mixed ester, ether or mixed ether; and

11 wherein the modified glycoside is in the form of a vitreous glass matrix and has a
12 bioactive substance incorporated therein.

1 17. The optically clear coating of claim 16 further comprising an optically active dye.

1 18. A method of making a vitreous solid delivery system, the method comprising:

2 a) forming a modified glycoside composition, which is capable of forming a
3 vitreous glass wherein said composition comprises a modified glycoside having the formula:



5 wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the
6 subunits are linked in a linear or branch chain by glycosidic linkages; and

7 wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the
8 polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one
9 of the saccharide subunits; and

10 wherein the glycoside has at least one hydroxy group derivatized in the form of an
11 ester, mixed ester, ether or mixed ether; and

12 wherein the modified glycoside is in the form of a vitreous glass matrix and has a
13 bioactive substance incorporated therein; and

14 b) processing the modified glycoside and a substance to be released therefrom,
15 thereby to form a vitreous glass maxtrix having the substance incorporated therein.

1 19. The method according to claim 18 wherein step b) comprises melting the
2 modified glycoside and incorporating the substance in the melt, wherein the melt temperature
3 is sufficient to fluidize the modified glycoside, and insufficient to substantially inactivate the
4 substance, and then quenching the melt.

1 20. The method according to claim 18 wherein step b) comprises dissolving or
2 suspending the modified glycoside composition and the substance in a solvent effective in

3 dissolving at least one of the modified glycoside and the substance, and evaporating the
4 solvent.

1 21. The method according to claim 17 wherein step a) comprises acetylation of free
2 hydroxyl groups on a glycoside, thereby to form the modified glycoside.

1 22. The method according to claim 18 wherein step b) further comprises
2 incorporating into the glass matrix at least one physiologically acceptable glass selected from
3 the group consisting of carboxylate, nitrate, sulfate, bisulfate, a hydrophobic carbohydrate
4 derivative and combinations thereof.

1 23. The method according to claim 18 wherein step b) further comprises forming the
2 vitreous glass matrix into a form selected from the group consisting of lozenge, tablet, disc,
3 film, suppository, needle, microneedle, microfiber, particle, microparticle, sphere,
4 microsphere, powder, and an implantable device.

1 24. The method according to claim 18 wherein the substance is a pharmaceutically
2 active chemical.

1 25. The method according to claim 18 wherein the substance is selected from the
2 group consisting of lipids, proteins, peptides, peptide mimetics, hormones, saccharides,
3 nucleic acids, and protein nucleic acid hybrids.

1 26. A method of forming an optically clear material comprising combining an
2 optically active dye with a modified glycoside composition comprising a modified glycoside
3 having the formula:

$$(Y)_n-X$$

5 wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the
6 subunits are linked in a linear or branch chain by glycosidic linkages; and

7 wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the
8 polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one
9 of the saccharide subunits; and

10 wherein the glycoside has at least one hydroxy group derivatized in the form of an
11 ester, mixed ester, ether or mixed ether; and

12 wherein the modified glycoside is in the form of a vitreous glass matrix and has a
13 bioactive substance incorporated therein, and processing the combined dye and modified
14 glycoside to form an optically clear glass having the dye incorporated therein.

1 27. The method of claim 26 wherein the optically clear glass comprises a filter
2 device.

1 28. The method of claim 26 wherein the method further comprises forming a coating
2 of the optically clear glass on a surface.

1 29. The method of claim 28 wherein the surface is plastic or metal